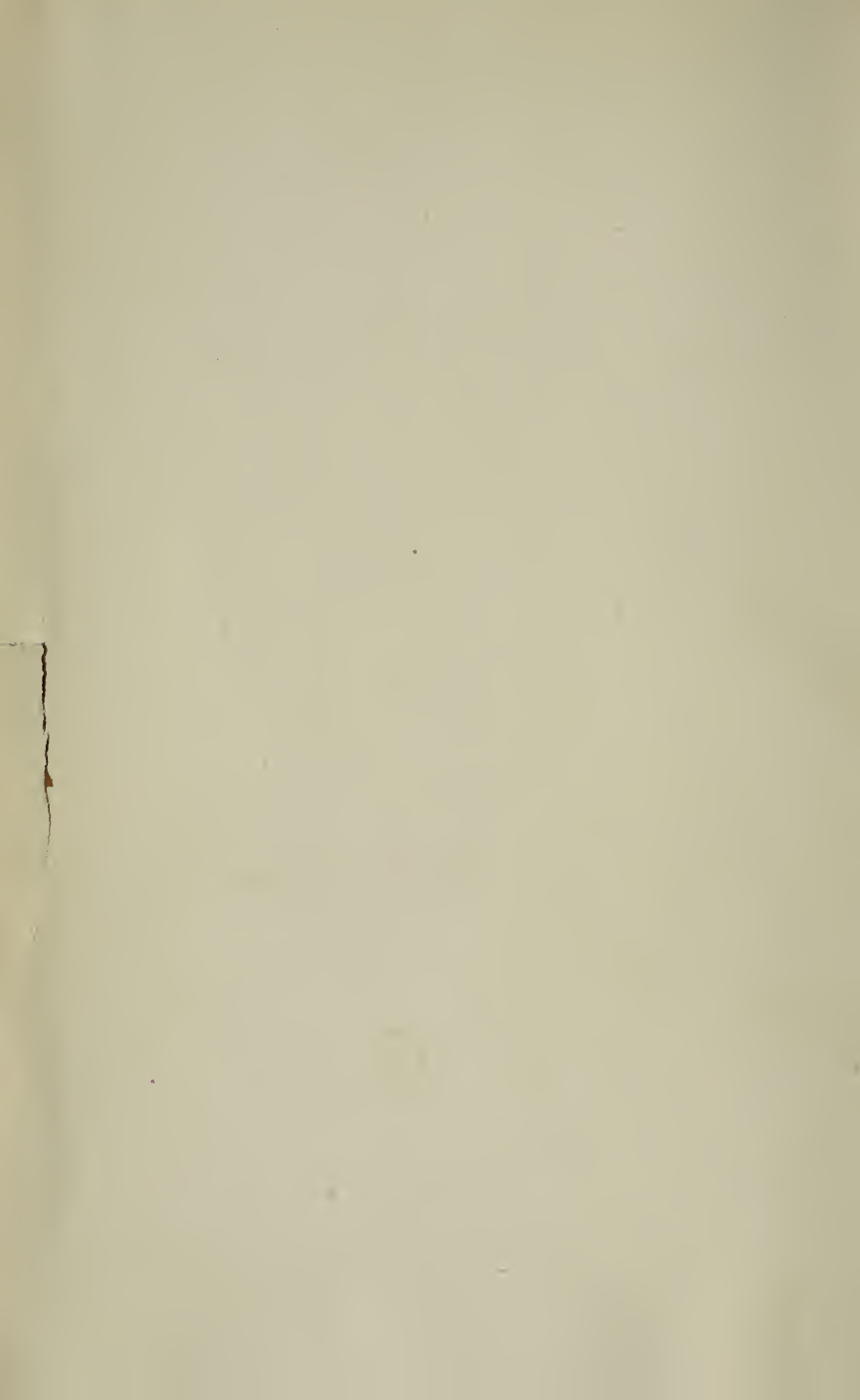


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27
HIS GRACE THE DUKE OF ARGYLL

ON

INDIAN PUBLIC WORKS

AND

COOPER'S HILL COLLEGE.

A REPLY,

WITH

CORRESPONDENCE BETWEEN HIS GRACE

AND THE PRESIDENT OF THE

INSTITUTION OF CIVIL ENGINEERS.

LONDON:

E. & F. N. SPON, 16, CHARING CROSS.

1882.

PREFACE.

The remarks of his Grace the Duke of Argyll which called forth the following reply, were made in a discussion in the House of Lords on a motion by Lord Belper, on the 15th of July last, as reported in the *Times*. The reply itself appeared in *Engineering* as three separate articles under the heading “Military Engineers in India,” and is now reprinted in a collected form, together with the correspondence on the same subject which has passed between his Grace the Duke of Argyll and the President of the Institution of Civil Engineers; as published in the *Times* of the 10th of January, 1882.

It is hoped that a perusal of these pages may tend to throw some light, not only on the particular question dealt with, but also on the reorganisation and requirements of the Public Works Department which are at present under the consideration of the Secretary of State for India.

LONDON,

February, 1882.

REFERENCES.

- 1.—*The "Times" of the 16th July, 1881.*
- 2.—*The Supplement to the Government "Gazette of India," dated 3rd December, 1870.*
- 3.—*The Government "Gazette of India," dated 2nd November, 1872.*
- 4.—*The Extra Supplement to the Government "Gazette of India," dated 12th November, 1872.*
- 5.—*A Return to the House of Commons, No. 115, dated 15th March, 1871, on a proposed Indian Engineering College.*
- 6.—*A Return to the House of Commons, No. 148, dated 16th March, 1871, containing correspondence on the same subject.*
- 7.—*Appendix No. 1 to the Annual Report of the Council of the Institution of Civil Engineers, dated 21st December, 1869.*
- 8.—*Minutes of the Proceedings of the Institution of Civil Engineers, vol. 33, pp. 184-187.*
- 9.—*Circular No. 84 of the Government of India, dated Simla, 6th October, 1869.*
- 10.—*A Minute on the reorganisation of the Indian Public Works Department by Colonel Sir A. Clarke, R.E., K.C.M.G., dated June, 1877.*
- 11.—*Public Works in India: A Letter to the Right Hon. W. E. Gladstone, &c., by A. R. Binnie. Published by Spon, 16, Charing Cross.*
- 12.—*A Return to the House of Lords, No. 175, dated 19th July, 1881, on Cooper's Hill College, moved for by Lord Belper.*
- 13.—*The "Times," 12th July, 1881.*
- 14.—*The "Times," 10th January, 1882.*

FIRST ARTICLE.

(NOVEMBER 4, 1881.)

In the *Times* of July 16, 1881, his Grace the Duke of Argyll is reported to have said: "The Indian Government had lost annually enormous sums of money by the carelessness and incompetence of many of the civil engineers in India, and when holding the office of Secretary of State for India he found that it was hardly possible to obtain in the open market a sufficient number of competent men to conduct the public works in India on a scale such as that on which they were then being undertaken. Some of the civil engineers in India at the time to which he referred were very distinguished persons, but there were also a number of inferior men who might have been called 'hard bargains.' On one occasion some millions were spent under the direction of the engineers of India in the construction of new barracks. It turned out, however, that these buildings had been erected in accordance with entirely erroneous principles, and that they were mere 'sun traps.' They were tremendously hot, and in consequence the health of the troops quartered in them suffered severely. Many of them were so insufficiently built that it

was found they would not last for more than a few years, and in some cases even the lime that had been used was pronounced to be bad. In this way the Indian Government were annually losing hundreds of thousands of pounds in bad engineering. The insufficiency of the engineering service having been brought prominently before the notice of the India Office, the authorities formed the idea of the erection of Cooper's Hill College."

These charges, if they can be substantiated, form one of the gravest indictments ever brought against English civil engineers, and at the same time contain one of the most sweeping accusations ever made by a responsible statesman against a Government department which had come under his administration.

For they amount to this: 1. That owing to the carelessness and incompetence of the civil engineers in India, enormous sums of money had been wasted; for example, as instanced by his Grace in the serious barrack failures quoted; and, 2, that the civil engineers who could be obtained in England were found so incompetent that Cooper's Hill College had to be established to supply properly qualified men.

When in July last we first saw the Duke of Argyll's speech, we felt instinctively that either his Grace must have made some grave mistake, or that he had been grossly misled as to facts by

some persons interested in casting a slur on the civil engineers in India ; but we refrained from any comment at the time, knowing his Grace's high character for truth, justice, and exactitude, until by reference to India we ourselves could certify as to the accuracy of certain facts on which his statements depend. We propose first to examine the allegations that the failures of the barracks referred to are attributable to the civil engineers in the service of the Government of India.

As to the faults of design of which his Grace complained, a reference to the records of the Government of India, and to the Blue Books published at home, will show that the general designs were settled by a board composed of medical and military officers, under whom the Public Works Department prepared and issued standard plans of all barracks to be constructed.

At home the War Office Commission had the advantage of the assistance of General Sir Proby Cautley, K.C.B., and Sir Randal Martin, C.B. And certain military officers, Captain Tulloch, R.E., and others were sent from India to England to study barracks sanitation at the public expense. In each particular case in India, the site having been selected by the proper military officers, the plans and estimates of the barracks were prepared according to the standard plans, and the final design was in all cases, before execution, approved

and sanctioned by the Inspector-General of Military Works, who it is needless to say is always an officer of the corps of Royal Engineers.

Under these circumstances it would be unjust to charge civil engineers with the "entirely erroneous principles" in accordance with which these barracks have been erected.

There were several serious barrack failures during the Duke of Argyll's administration at the India Office ; and we propose at present to glance at some few facts relating to one of them.

As to the Saugor Barracks, it is well known that shortly after their erection they failed and became unsafe, involving a loss of £166,000 to the State. We find in the extra supplement to the *Gazette of India* of November 12, 1872, an elaborate report of a Committee independent of the Public Works Department, presided over by Major-General C. T. Chamberlain, C.S.I., covering 111 pages, from which we learn that the barracks were designed according to the usual standard plans by Captain H. R. Faber, R.E.; these plans and the necessary estimates were passed by the chief engineers, Colonel W. Maxwell, R.A., and Colonel C. Pollard, R.E., also by the superintending engineer, Lieutenant-Colonel A. Allen, S.C., and that they were sanctioned by the Government of India when Colonel Crommelin was Inspector-General of Military Works.

The barracks were erected entirely by Captain Faber, R.E., under the superintendence of Lieutenant-Colonel A. Allen, and were inspected during construction by Colonel C. Pollard, R.E., and Colonel Crommelin, and we notice that Captain Faber received rapid promotion at the hands of his military superiors for his work done at Saugor.

If we now turn to the *Gazette of India* for November 2, 1872, pages 1024 to 1027, we shall find the orders of the Government of India on the report of the Committee above quoted. Captain H. R. Faber, R.E., was dismissed from the Public Works Department and his services placed at the disposal of the Military Department; Colonel C. Pollard, R.E., was reduced from the rank of second to third-class chief engineer for one year; and Mr. C. Campbell was reduced from first to second grade superintending engineer for one year.

As to the superintending engineer, Lieutenant-Colonel A. Allen, S.C., who died before the inquiry was made, the Government of India remark on page 1025, paragraph 5, "That Lieutenant-Colonel Allen's antecedents were not such as to justify his appointment to the post of Superintendent of Works at Jubbulpore. If a competent officer had filled that position it is probable that the defects in the construction of

the barracks would have been remedied before they had become irretrievable."

Mr. T. Armstrong was censured, and an explanation called for from Colonel Crommelin. Messrs. Campbell and Armstrong, the only civil engineers dealt with, as will appear from the report of the Committee, had little or nothing to do with the construction of the barracks; in fact Mr. Armstrong, see paragraph 19, page 1026 of the Government order, "was not responsible for the construction of the barracks, and deserves the credit of having been the first officer who discovered the real character of the works."

There is little doubt that these civil engineers were blamed (see report of the Committee) not for incompetence or ignorance, but because they "hoped to be able gradually to replace the bad work at a moderate cost without creating a public scandal, and bringing disgrace, or professional ruin, or degradation, on the officers who erected these barracks." They were punished not for faults they had committed, but because they generously endeavoured to hide from the public the shortcomings of their military brother officers and military departmental superiors.

We incidentally notice that of Captain H. R. Faber, R.E., the Committee reported, page 17, paragraphs 50 and 51, "Captain Faber's previous experience in the Department of Public Works

had not been of such a nature as to bring his theoretical knowledge fully to bear on the practical details required for the construction of large buildings. . . . Whoever has read the Committee's proceedings, or the previous portion of this report, will have formed an opinion upon this officer's utter want of technical knowledge, such as would fit him for the duties of an executive engineer charged with the departmental construction of large and important works ;" and on page 19, paragraph 75, speaking of his powers of organisation and control, the Committee say :

"An inspection of Captain Faber's order books and a consideration of his own evidence, as also that of Sergeants Wilkinson and Herbert, show unmistakably that Captain Faber is deficient in both these essentials."

Yet notwithstanding this very strong expression of opinion we find that so powerful are the military men at the head of the department, that after Captain Faber's dismissal from the Public Works Department by Government, he was reappointed to it as executive engineer, fourth grade, and that he has been promoted over the heads of many civil engineers of tried and approved experience, until, as will be seen by reference to the last published classified list of the department, he now occupies the position of executive engineer of the first grade.

We do not at present propose to weary our readers by recapitulating the facts of the great Allahabad failure, for causing which another batch of military officers were either dismissed, degraded, or censured by the orders of Government, nor do we now propose to review the case of the failure of barracks at Neemuch and at Jubbulpore. Sufficient facts are before us to cause considerable public anxiety as to the wasteful and shameful loss of public money caused by some of the officers of the Indian Public Works Department, as noticed by the Duke of Argyll, but when we look at the above-quoted facts, facts vouched for by the Government of India, we cannot agree with his Grace that it has been caused by the "carelessness and incompetence" of civil engineers.

The civil engineers in the department, most of them identically the same men that served Her Majesty during the Duke of Argyll's administration, number nearly three-fourths of the total strength of the department, and to their credit must in a great measure be ascribed the successful carrying out of all the large works recently constructed in India.

Let inquiry be made as to the management of such works as the Holkar State Railway; Wurda Valley Railway; Warrorah Colliery; the Bopal Ghat Railway; the Nagpur and Chattesghur State

Railway; the Narbudda, Ravi, Chenab, Jhelum, and Empress Bridges; the Nagpur Water Works, and a dozen others; undertakings costing many millions and reflecting credit on the engineers of any country, and we feel confident that even the Duke of Argyll will be the first to offer his praise and commendation to the civil engineers who have carried them to a successful completion.

But a very grave question arises, and in the interest of the public must be inquired into, and that is, how did it arise that his Grace was led to make such sweeping charges against so large and so important a body of Her Majesty's servants? He states that a great loss of public money is going on. It is imperative therefore that the authors of this wasteful expenditure should be discovered and pointed out.

We at once absolve his Grace from any personal prejudice; but from where did he obtain his information? He could only obtain it at the India Office, where his councillors in public works matters were exclusively old Royal Engineers, who would naturally only be too ready to hide the shortcomings of their brother officers, the military men in India, by throwing the blame on civil engineers. And if inquiry be made it will be found that in India the department is governed almost exclusively by and for the advantage of a comparatively few Royal Engineers, some of

them no doubt as incompetent as Captain Faber ; and in such a manner as to exclude from the confidence of Government tried, trusted, and experienced civil engineers, who have, as noticed by Colonel Sir Andrew Clarke, K.G.M.C., in the 51st paragraph of his minute on the reorganisation of the department, served Her Majesty loyally, faithfully, and patiently, notwithstanding the obloquy that has from time to time been cast upon them by the military men at the head of the department.

SECOND ARTICLE.

(NOVEMBER 11, 1881.)

In continuation of our remarks of the 4th inst., and before proceeding to the second question, viz., the impossibility of obtaining properly qualified engineers in England to carry out work in India, we must recall the attention of our readers to the great failure which took place at Allahabad, by which not only did a large store room attached to the Gun Factory fall during construction, but four persons were killed and seven others seriously injured (as noticed by us at the time, see January 6, 1871, page 6). We feel called upon to do this more particularly as the Duke of Argyll appears from his reference to some cases in which "even the lime that had been used was pronounced to be bad," to have had this special instance before his mind at the time he spoke.

If we turn to the supplement of the *Gazette of India* for December 3, 1870, we shall find the minute of the Government of India, where it is recorded that this failure was also made the subject of inquiry by another special committee independent of the Public Works Department, presided over by Major-General Travers, V.C., and from which we learn that the cause of the

failure was the bad quality of the lime used, specimens of the mortar taken from the walls only containing on analysis 6 per cent. of lime (see paragraph 20). The orders and remarks of the Governor-General in Council are as follow :

Supervisor Bartram, a fitter by trade, and a member of the Upper Subordinate Establishment, who had passed out of the Roorkee College, was removed from the Public Works Department (see paragraph 26). This man was in all probability a retired private, corporal, or sergeant. Of Major W. Jackson, the executive engineer under whom "The whole of the work which has failed was carried out," the Government records, paragraph 30, that he "is wanting in the qualities essential to a successful service in the Public Works Department, particularly in energy and power of control." . . . "It may be further noticed that the unfitness of this officer for the important post of executive engineer is borne out by the unskilful manner in which, as brought to light in the papers submitted, he designed an ordinary scarf for a beam; the error made was a very flagrant one, evincing ignorance of the elementary principles of carpentry." Major W. Jackson was removed from the department.

Of Mr. Clarke, who succeeded Major Jackson, it is recorded, paragraph 31, that he "is not in any way responsible for the work in the walls of

the building that failed :” and mention is made of “the fact that he had stopped certain of the contractor’s works elsewhere in consequence of being dissatisfied with the mortar.” He is warned and cautioned for the future, but not degraded, censured, or dismissed.

Of the superintending engineer, Lieut-Col. C. D. Newmarch, R.E., it is recorded that he was ill at Raneekhet and Nyneetal during the construction of the work at Allahabad, and died before the failure. Of the superintending engineer, Major Cobbe, Government records that in their opinion, paragraph 34, “neglect of duty is more attributable to Major Cobbe than to any other of the controlling officers.” He was dismissed from the department.

Of the superintending engineer, Lieut.-Col. Rose, it is recorded, paragraphs 40 and 41, that he “must stand convicted on his own evidence of having signally failed to pay due regard to the responsibilities and duties of the important post of superintending engineer.”

“Two other serious instances of failure of duty while he was an executive engineer at Rawulpindi have, however, been lately brought to the notice of the Government of India.” Lieut.-Colonel Rose is therefore also dismissed from the department.

Superintending engineer, Lieutenant-Colonel

Alexander (see paragraph 44) "has in consequence of his proceedings in this case, been placed in a grade lower than that in which he would otherwise have appeared." Colonel Hodgson, the chief engineer, is severely censured. His Excellency in Council remarks, paragraph 49, "that it is a blot on the administration of the Public Works Department in the North-Western Provinces, for which the chief engineer must be held responsible;" the lime contractor is ordered to be prosecuted; and the minute terminates with paragraph No. 54, which commences: "In conclusion, his Excellency the Governor-General in Council desires to record that he has reviewed with great sorrow this deplorable history of negligence, incapacity, and corruption."

Can any record of facts be more conclusive than the cases of these two failures at Saugor and Allahabad, or can words more forcible than those of Lord Mayo above quoted be conceived as proceeding from the head of any Government, reflecting such condemnation on the management and officers of any department? It must be remembered that these military officers who showed such "carelessness and incompetence," were not engaged on difficult civil works, with which they might be supposed to be unacquainted; but were employed on military buildings which fall within the sphere of their own proper duties,

and failed in the simplest details, as well as in matters of the greatest responsibility intrusted to them.

We have here not one or two isolated cases of individual incapacity brought to light by these inquiries, but no less than twelve or fourteen military men occupying every grade in the department, both Royal Engineers and staff corps officers, varying in rank from colonels to sergeants, more or less implicated, after a fair trial, conducted not by civilians but by brother officers, and we may judge them to be a fairly representative body by the fact that one has since been made and now is a chief engineer of the first-class, and one an executive engineer of the first grade. We defy his Grace the Duke of Argyll or any other person to point to such a wholesale case of professional ignorance or dereliction of duty among English civil engineers in India or any other country.

That competent civil engineers could not be obtained in England to go to India is a statement which can be disproved in many ways; in the first instance, not even the Duke of Argyll will deny that there are plenty of good and fully qualified engineers in England. A glance at the face of the country, covered as it is with its roads, bridges, canals, railways, telegraphs, docks, water works, and systems of drainage, proves it to be the very

home of modern engineering; even if it were not on record that besides these, English civil engineers had constructed works in almost every country in the world; and that there are 1270 members and 1422 associate members belonging to the Institution of Civil Engineers. Again, the men sent out to India previous to 1870, of whom his Grace complains, and who were selected by the open competitions initiated by the present Earl Derby, and hence called Stanley engineers, are thus spoken of by Sir A. Clarke in paragraph 92 of his minute on the reorganisation of the department, when comparing their merits with those of men sent from Roorkee and Cooper's Hill. "Without going into detail, the impression left on my mind after a perusal of these reports is that the Stanley engineers stand first in order of utility. They brought with them to India, in all instances, some practical professional knowledge, and in some cases it was of a very useful order." This is the opinion of a distinguished Royal Engineer of the outcome of the men, and the system condemned by the Duke of Argyll.

It stands on record in published official papers that (see letter to the Government of India 119 of 30th of November, 1869), the Duke of Argyll, aided by certain Royal Engineers, Colonel G. Chesney and Major-General Baker, determined on the establishment of Cooper's Hill College, and

that Colonel Chesney should be its first principal or head, without consulting either the Government of India or the Institution of Civil Engineers, who were both bodies pre-eminently qualified to assist him by their opinion on the subject. On being informed of the determination of the Duke of Argyll to establish the college, the Government of India reply (see letter 43 of 28th of March, 1870), paragraph 3: "We consider the success of such a college to be a matter of very great uncertainty, that it must be regarded entirely as an experiment, and that we have great doubts that any real necessity exists for its immediate establishment." And in paragraph 5, "We feel it incumbent on us to record our strong sense of the inexpediency of adopting any measures that shall lead to the creation of a fresh close service for India." Again in paragraph 15, "and we are disposed to consider that it is owing to the insufficiency of the present salary of the young civil engineers on first entering on their duties in India, viz., 200 rupees monthly, say, £240 per annum, that the failure to fill the appointments in the Public Works Department offered for competition has mainly been due." And yet again in paragraph 18, "The institution (that is, Cooper's Hill College) in short would in our judgment be distinctly condemned if it could not be conducted on what would be an entirely self-supporting basis."

The Institution of Civil Engineers addressed to the Duke of Argyll a minute on the subject of Cooper's Hill College, dated March 15, 1871. Referring to the old mode of selection, "The President and Council submit that such a mode of selection could only lead to disappointment, as it in no way tested any of the qualifications of an engineer, excepting a retentive memory and a certain aptitude for figures." . . . "The practical training of engineers attainable in any college is at best imperfect." . . . "But in the proposed college the minds of the pupils will be moulded in the same forms. There will be none of the emulation of different schools of thought and action, and none of that independence and originality of resource which have produced the best engineers." The Council, in reference to the alleged failure to obtain the requisite number of civil engineers for India, point out that proper pay and equality with other officers, and improvements in the rules of the service, would remove that difficulty.

But his Grace the Duke of Argyll should be the last to forget that there was another powerful cause at work during his administration tending to check civil engineers entering the Indian service, because it was brought very forcibly before his notice on October 27, 1869, by a deputation consisting of the President and Council of the

Institution of Civil Engineers, viz., the issue by the Government of India on the authority of Colonel R. Strachey, R.E., of a notification No. 242, dated August 31, 1869, in which are these words, "That in the civil engineering profession in England it is a recognised practice for civil engineers employed by public companies and otherwise, to receive in addition to the salaries paid them by their employers, commission on contracts given out, or stores and materials ordered or inspected by them." This gross slander on a large and honourable body of professional men was repudiated indignantly at the time by the Institution of Civil Engineers, but it produced an effect not easily removed, especially when it has been found that the Government of India have taken no very active steps to do so, beyond making promises of equality of pay and position to civil engineers in India, which promises after twelve years remain unfulfilled.

Nor has it tended to allay the unfortunate feeling thus created among civil engineers at home and in India, when it is seen that the author of this gross slander, the repudiation and denial of which by the Institution was at once regarded with "implicit confidence" by his Grace the Duke of Argyll (see letter from the India Office to the president, dated October 29, 1869) has since been promoted from post to post, and decorated

with the Star of India ; until we now find General R. Strachey, R.E., the chief and trusted councillor of the Secretary of State on all public works matters at the India Office.

We believe that we have proved on the authority of the Government of India, of Colonel Sir A. Clarke, and of the Institution of Civil Engineers, that the establishment of Cooper's Hill College was unnecessary, and that good men could be obtained without such expensive machinery or the creation of another closed service for India. On the 21st of October last we reviewed (see Appendix No. 1) a return made to the House of Lords on the cost of Cooper's Hill, from which it appears that each young man sent to India costs Government about £321; on this ground alone the college stands condemned by the Government of India (see their letter above quoted). But besides this, Colonel Sir A. Clarke, R.E., records of Cooper's Hill men in his minute on the department, that they "have really no practical knowledge of their profession, and for some time after joining the department are of very little use indeed." We think, therefore, on public grounds, and looking to the interest of the department, that a return should be made to some improved system of open competition, which formerly gave India men of "some practical professional knowledge" at no cost to the State,

while encouraging the pupils of the various independent engineering colleges in England, Ireland, and Scotland, who are at present shut out from the Indian service.

THIRD ARTICLE.

(DECEMBER 2, 1881.)

The public at large, and those of our readers who have perused our previous articles on this subject, should feel deeply indebted to his Grace the Duke of Argyll, and Lord Belper, for calling attention to it at a time when it is known that the reorganisation of the department is under the consideration of the Secretary of State for India. There can be no doubt both from the remarks of his Grace, and a careful perusal of Colonel Sir A. Clarke's minute on the subject of reorganisation, that a state of things exists in India calling for immediate public attention, and this is tacitly admitted to be the case by Lord Hartington in his reply to Mr. Carbutt in the House of Commons on the 11th of July last, for there must be something radically wrong when noblemen and gentlemen occupying important official and public positions tell us that "the Indian Government were annually losing hundreds of thousands of pounds on bad engineering," "and that the ratio of the cost of establishment to expenditure on actual works was excessive."

A very careful examination of the whole question has led us to the conclusion that there is

some fundamental defect in the Indian Public Works Department; and a very cursory examination, in our humble opinion, is amply sufficient to point out where it exists.

For the proper carrying out of large public works of national importance, men are required who have made the subject the study of their lives, and whose experience has been gained by the actual and practical carrying out of works of their own design, and under their own immediate control and supervision; but above all they must be men who not only have their hearts in their work, but whose reputation and position in the world depend upon their success in their own proper professional avocations. By this we do not mean merely the success of obtaining a competent salary of so much per annum, but the far higher reward which springs from a consciousness of good work, well done, and publicly acknowledged.

As Sir A. Clarke remarks in his fourteenth paragraph, "The amount of mischief which an engineer who is incompetent from any cause whatever can effect is almost beyond calculation, and it is cheap to pay anything to get rid of such men. Their mistakes are irremediable. The money has been spent on bad and useless work and cannot be unspent."

The public works of India are no child's play,

or a thing the carrying out of which can be taken up and again laid aside after a few years, in the intervals of the more serious prosecution of some other more honoured or esteemed profession. At present they involve the receipt and expenditure of some twenty-four millions of public money every year; and when we remember that not only the welfare of future generations depends on their success, but the actual stability of the Indian finances rests upon their proper execution, we feel that every one must admit the necessity of the most careful organisation of the department to which they are entrusted.

It might have been reasonable and economical in the earlier days of the Public Works Department in India, when all that was required was the construction of a few barracks, forts, and roads, to entrust their management and control exclusively to military men, as noticed by Sir A. Clarke; but as larger works of a more exclusively civil character now form the great bulk of the work to be done, it would be a suicidal policy to leave their execution and control in the same hands; and this the Government of India have partly acknowledged by employing from time to time numbers of civil engineers to carry out work which fell within their own immediate province, until they now form the majority of the department.

But while so far acknowledging the necessity for civil engineers, Government has made the mistake of continuing to centre the control and management of the department in all its highest offices, both in India and at home, almost exclusively in the hands of a comparatively small body of favoured military men.

We have recently reviewed (see our articles of the 4th and 11th ult.), on the authority of Government itself, and as judged by their brother officers, what the value of these military men, whether belonging to the staff corps or the Royal Engineers, actually is when employed upon their own proper military engineering work; and we feel confident that no Government can long continue to entrust to such hands the exclusive control of all the public works of India, both civil and military.

We are not among those who would altogether exclude military officers from employment on civil works, for Government must at all times be free to obtain what men it pleases to discharge its duties; but if military engineers are to be so employed in the future it should in all cases be under exactly the same circumstances as civil engineers. On joining the Public Works Department, if with the intention of remaining in it, and when their so joining is not a temporary measure merely, they should give up their military pay and

promotion and be allowed no claim to return to military duty should they fail in civil employ, otherwise the public and the State have no guarantee that they will be charged with the due responsibility attached to their new duties, the absence of which forms so lamentable a feature in the cases of the officers at Saugor and Allahabad, and by which alone can be prevented the public scandal of seeing men who have been dismissed from the department by Government for incompetence, again appointed over the heads of many good civilians of experience.

This is no new idea, or one which should be repugnant to the best class of military men, for the great Duke of Wellington lays down the rule* for an officer in India that may be employed on civil duties, "he should be struck off the strength of his regiment, and that from that period he should receive no regimental pay, and an officer should be promoted in his stead."

Instead of trying to attract to its service by just and equitable rules, and the bestowal of suitable rewards, the best men that can be obtained either within the department itself or in the country at large, what do we find hitherto to have been the practice of the Government of India?

* See Sydney Owen's selections from the despatches, memoranda, and other papers relating to India of Field-Marshal the Duke of Wellington, K.G.

That all the superior posts in India are almost exclusively filled by Royal Engineers ; that besides the pay which a Royal Engineer draws as a member of the department, he receives his military pay as well ; his pension rules are much better than those of civil engineers, and he receives it in pounds sterling. On the other hand the civil engineer, as regards retirement and pension, is placed under rules originally framed for a subordinate native civil service, and which Sir A. Clarke says are "wholly inadequate to meet the case," and pensions being paid in rupees, nominally of the value of 2s., only yield 1s. 8d. in consequence of the rate of exchange.

These glaring and unjust inequalities have long engaged the attention of both the Secretary of State and the Government of India, and have been acknowledged and promises held out that they would be abolished. For instance the Duke of Argyll says in his letter No. 119, paragraph 3, to the Governor-General of India, dated 30th of November, 1869, "It cannot fail to conduce to better harmony between the military and civil branches of the establishment if whatever advantages are accorded to the members of one, on first entry, should be obtained by both."

And again, in paragraph 4, his Grace says, "and I would further wish you to consider whether there ought not to be only one scale of

salaries and allowances for all members of the service, both civil and military."

In the reply from the Governor-General to the Duke of Argyll, No. 43, paragraph 16, dated March 28, 1870, Lord Mayo says, "We may remark that we have already recommended the equalisation of the pay of the military and civil branches of the department." . . . "On this point we only add that we shall be glad to see some plan adopted by which the furlough allowances of civil engineers shall be equalised with those of military officers in the Public Works Department, and so far as practicable, their advantages of pension also." In circular No. 84, dated Simla, October 6, 1869, the Government of India say that it "has lately had before it proposals, which it is hoped will take early effect, for improving their (the civil engineers') position generally, and placing them, in respect to their emoluments, on precisely the same footing as all other officers employed on the same duties." And yet, notwithstanding these repeated declarations of Government, so strong are the military men at head-quarters, both in India and at home, that as yet little has been done to carry them into practice.

What is actually required, in our opinion, to place the department on a basis which will allow of the best men, whether civil or military, being

brought forward, and encouraged in the service of Government, is a perfectly just and equitable reorganisation which would abolish all class prejudice, without in any way dealing injuriously with any man. The necessary requirements may be summed up as follows :—

1. Perfect equality of pay between all officers of the same grades in the department, be they civil or military men.

2. All promotion in all the grades or classes in the department, from the lowest to the very highest (if made either by seniority or by selection), to be made regularly in proportion to the total number of military and civil men respectively. For instance, if three-fourths of the total strength of the department are civil engineers and one-fourth Royal Engineers, then of every four vacancies which occur, three should be filled from among the civilians and one from among the military men.

3. As all civil engineers who are now, and have been for some years past, sent to India, are under covenants or agreements with the Secretary of State, they should be treated as regards pension in every way like the other covenanted civil servants of Government, and thus the desirable end would be arrived at to which Sir A. Clarke points in the 67th paragraph of his minute.

4. Cooper's Hill College having failed both

financially and practically, a return should be made to an improved system of open competition, on a basis which we feel confident could be arranged by the Secretary of State, should he be pleased to call to his assistance the Councils of the Institution of Civil Engineers, and of the various engineering colleges of London, Manchester, Edinburgh, Glasgow, Dublin, &c.

5. To assist the Secretary of State in public works matters at the India Office, to render his Council as representative of the service in India as possible, and to guard against the preponderance of one class over another, he should call to his assistance one or two civil engineers of tried experience who have retired from service in the Public Works Department.

A prize to be aimed at would thus be afforded which would do much in itself to raise the whole tone of the department, and guard the Secretary of State from those errors which we have pointed out in our former articles; for we cannot but think that had he been properly advised his Grace the Duke of Argyll would never have made the statements which fell from him in the House of Lords.

As promised by Lord Hartington, this subject of the reorganisation of the department will be brought before Parliament next session; and we venture to hope that the public, the Institution of

Civil Engineers, and the heads of the various engineering colleges, will see that it is thoroughly inquired into, and that impartial justice is meted out to those who may be found to deserve censure. Unfortunately the civil engineers in the India service are prevented by an unjust order of Government from exercising their rights as Englishmen by petitioning the House of Commons ; but we feel sure that this disability will not prevent their cause, with its glaring instances of injustice and favouritism, from being espoused by some men of spirit and integrity who care more for the justice of our rule in India than for a military clique, however powerful.

APPENDIX I.

THE INDIAN PUBLIC WORKS DEPARTMENT,

(Reprinted from ENGINEERING, October 21, 1881.)

We would draw the attention of all our readers who may be interested in Indian Public Works to two very important documents which have recently been made public; and which cannot fail to be of interest at a time when it is known that the claims of civil engineers serving in India to be placed on grounds of equality with other members of the Civil Service are under consideration by Government.

The first is a most careful and elaborate minute by Sir Andrew Clarke, R.E., K.C.M.G., &c., late public works member of the Governor-General's Council, in which he reviews the history of the department, points out many of its defects; notices the "chronic discontent" among its officers; gives his opinion of "the utter unsuitability of the existing pension rules, framed to meet a state of things that has long since passed away;" and as regards Royal Engineers, he says "The charge of the military works in India should be their first and special duty, as is the case in

England. It should moreover be considered military obligation, so that any officer may be ordered to join that branch of the public works." Writing of the pension rules of civil engineers and their proposed assimilation with those of the other covenanted servants of Government, he says, "I have always failed to see the *raison d'être* for the invidious privileges claimed for the so-called Covenanted Civil Service. It will be a happy day when these distinctions have ceased to exist."

On the subject of the establishment of the Royal Indian Engineering College at Cooper's Hill, Sir Andrew Clarke says, "I must say I personally have never approved of a special civil engineering college in England for the supply of engineers to the Public Works Department, and I cannot find that the previous opinion of the Government of India was ever asked. . . . I believed at the time that the establishment of the college was quite unnecessary, and this opinion was shared by the Council of the Institution of Civil Engineers."

This brings us to the second document to which we would draw attention, a return made to the House of Lords on the motion of Lord Belper, of annual expenditure and receipts of Cooper's Hill College, with the number of students who entered the college and have been sent to India

each year, dated 25th July, 1881. From it we find, page 8, that the total expenditure has been £317,219, and the total receipts £149,680, during the past ten years; we notice also that the receipts have gradually decreased from £18,254 in 1877-78 to £15,121 in 1880-81; so that there appears to be a balance of expenditure of £167,539 in excess of the receipts, which latter appear to be annually diminishing.

The number of students who have entered the college since its foundation is 450, of whom 299 have gone to the Public Works Department of India.

If we deduct £119,076 originally spent on the college for its purchase, &c., we get £198,143 as the expenditure for the past ten years, or say nearly £20,000 a year, but to this sum we must add interest at 4 per cent. per annum on the capital account, which gives us a gross total of actual expenditure £198,143, plus simple interest for ten years at 4 per cent., £47,630, which equals £245,773 spent in producing 299 assistant engineers; the total receipts of the college being only £149,680 it would appear that there is a deficit of £96,093, or at the rate of say £321 per head on each of the young men sent to India. We hope that these two documents will receive the attention they deserve, for they are both calculated to throw much light on a subject very

important to many members of the profession, and which, as promised by Lord Hartington on the 11th July, 1881, is to be laid before Parliament, and to which we may have occasion to refer at some future time.

APPENDIX II.

Correspondence with THE DUKE OF ARGYLL.

Telegraphic Address : INSTITUTION, LONDON.

THE INSTITUTION OF CIVIL ENGINEERS,

Established 1818.—Incorporated by Royal Charter, 1828.

25, GREAT GEORGE STREET, WESTMINSTER, S.W.

29th November, 1881.

To His Grace

THE DUKE OF ARGYLL, K.T., &c.,

Inverary Castle,

Argyllshire.

MY LORD DUKE,

I have been requested by the Council of this Institution—the Session 1881-82 having commenced—to bring to your Grace's attention the enclosed copy of a *Times* report of a speech delivered by your Grace in the House of Lords on the 15th of July last, after the Session 1880-81 of the Institution had terminated, and to express the great regret of the Council that your Grace, acting on erroneous information, should have charged upon Civil Engineers the failure of certain Barracks in India, as regards design, construction, and materials.

The Council trust that your Grace will be good enough to inquire into the actual facts, feeling assured that such inquiry will result in showing that the design and execution of the Barracks which failed were not under the control of Civil Engineers.

I have the honour to be,

My Lord Duke,

Your Grace's obedient Servant,

(Signed) JAMES ABERNETHY,
President.

[ENCLOSURE WITH ABOVE]

EXTRACTS FROM PARLIAMENTARY INTELLIGENCE.

The TIMES, July 16th, 1881.

“The Duke of Argyll said that he took very great interest in Cooper's Hill College, which was founded during the time of his administration at the India Office. If a great School of Engineering had existed in India capable of supplying a sufficient number of competent men to execute economically the Public Works undertaken in India, it would have been folly on the part of the Government to start an Institution like Cooper's Hill College. But the Indian Government had lost annually enormous sums of money by the carelessness and incompetence of many of the

Civil Engineers in India, and when holding the office of Secretary of State for India he found that it was hardly possible to obtain in the open market a sufficient number of competent men to conduct the Public Works in India on a scale such as that on which they were then being undertaken. Some of the Civil Engineers in India at the time to which he referred were very distinguished persons, but there were also a number of inferior men who might have been called 'hard bargains.' On one occasion some millions were spent under the direction of the Engineers of India in the construction of new barracks. It turned out, however, that these buildings had been erected in accordance with entirely erroneous principles, and they were mere 'sun traps.' They were tremendously hot, and in consequence the health of the troops quartered in them suffered severely. Many of them were so insufficiently built that it was found they would not last for more than a few years, and in some cases even the lime that had been used was pronounced to be bad. In this way the Indian Government were annually losing hundreds of thousands of pounds in bad Engineering. The insufficiency of the Engineering service having been brought prominently before the notice of the India Office, the authorities formed the idea of the erection of Cooper's Hill College. The project was opposed

by a number of persons, including many members of Parliament, but eventually it was successfully carried out. He had always heard that it was considered that the College was a very thriving institution, but he quite understood that during the financial difficulties which India had recently felt, fewer Public Works had been erected, and that consequently there had been a diminution in the demand for the services of such Engineers as were trained at Cooper's Hill. In conclusion, he wished to assure their Lordships that the foundation of the College was not agreed to until a most thorough investigation had convinced the Indian Department of the insufficiency of the previous system."

INVERARY, *December 7th, 1881.*

SIR,

In compliance with the request conveyed in your letter of the 29th of November, I have made inquiry into the circumstances connected with the failure of certain Barracks in India, and I find that you were quite right in the representation you have made that the design and execution of the Barracks which failed were not under the control of Civil Engineers; and in particular I find that in the case of the Barrack at Allahabad, which called down upon the officers concerned

the severe animadversion of the Government of India, those officers were all Military and not Civil Engineers.

I make this Report to you of the result of my inquiries with the greater pleasure, because it was entirely by accident, and not by design, that the remarks I made last Session in the House of Lords seemed to point specially against the Civil as distinguished from the Military branches of the Indian Engineering Service. It was not my intention to make any such distinction. No such distinction was in my mind when I spoke, nor was any such distinction in my mind when, as Secretary of State for India, I was mainly responsible with the Indian Council for the establishment of the College at Cooper's Hill.

In the Papers presented to Parliament in March, 1873,* the grounds on which we acted were explained, and in those Papers no such distinction appears. We thought that, as regards both branches of the Service, there was evidence of occasional failures, of cases of deficient training, and of inadequate supply. Our concern at that time lay especially in the increased supply of Civil Engineers, which had become imperative from the great scale of Public Works then contemplated in India. But we wished to place

* Believed to be 1871.—SEC. INST. C.E.

equal reliance upon both branches of the service, and we dwelt upon the importance of an almost complete amalgamation. In Mr. Thornton's Minute of the 28th of February, 1869, you will observe that the building of Barracks was specially referred to as a class of works upon which Civil Engineers might in future be usefully employed, and this view may well have been suggested by the fact that the particular instances of failure in respect to that class of building which were then before us had been due not to Civil but to Military Engineers.

As President of The Institution of Civil Engineers you may very naturally have been concerned by any observations in Parliament which seemed to bear injuriously on the reputation of Civil as compared with Military Engineers in India. I beg to assure you that no such contrast or comparison has ever been entertained by me, and that I believe it would be as unfounded as invidious.

I have always regretted that the establishment of the College at Cooper's Hill was at first regarded with some distrust by a body of men for whom I entertain the highest admiration and respect. But I have much satisfaction in believing that this feeling has passed away; and that The Institution of Civil Engineers will see in this, and in every similar endeavour, only a new evidence

of the value attached to their distinguished profession, and to the supreme importance attached in the public mind to the high standard of training under which young men can alone be fitted to become members of it.

I am, Sir,

Your obedient Servant,

(Signed) ARGYLL.

To JAMES ABERNETHY, Esq.,
President Inst. C.E., London.

